

How to Use Maintenance Indicators in Fractal One

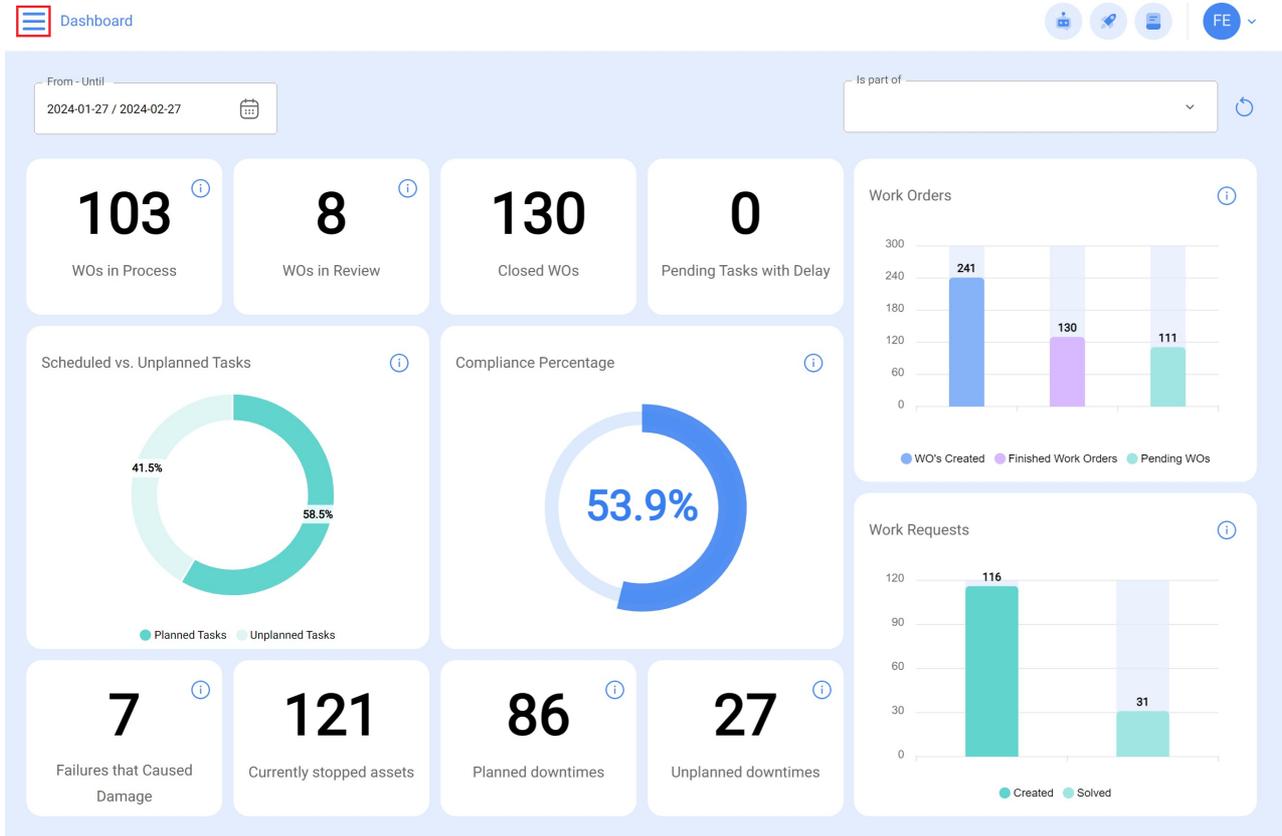
 help.fractal.com/hc/en-us/articles/24912122350093-How-to-Use-Maintenance-Indicators-in-Fractal-One

In Fractal One 5.0 there are 4 types of fundamental indicators in all maintenance management:

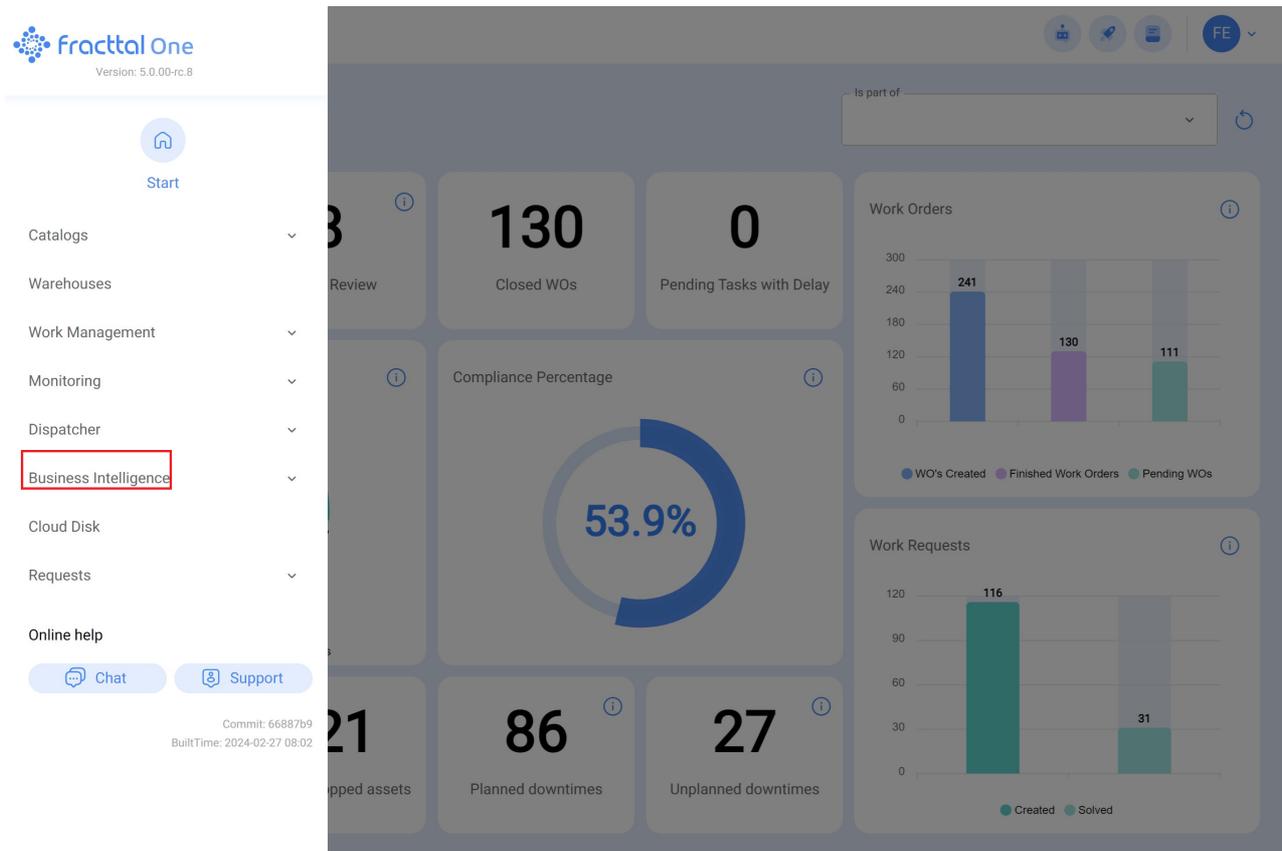
- **Maintenance availability:** The probability that a system, equipment or component will perform its intended function when required. It is expressed as a percentage and takes into account both the reliability and maintainability of the system.
- **Availability due to failures:** This is understood as the percentage of time during which a piece of equipment is fit for use and operational, but taking into account only the sum of the time due to unplanned shutdowns, failures and incidents of the equipment and physical assets.
- **Mean Time Between Failures MTBF (Mean Time Between Failures):** It is a measure of the average time between consecutive failures of a repairable system or component and as its name says, it is calculated from the time a failure occurs until the time after the other one occurs, so it includes the uptime and downtime periods.
- **Mean Time To Repair MTTR (Mean Time To Repair):** Indicates the average time required to repair a system after a failure. A low MTTR is desirable, as it implies fast recovery and less downtime.

How do we place them in Fractal One?

1. Click on main menu

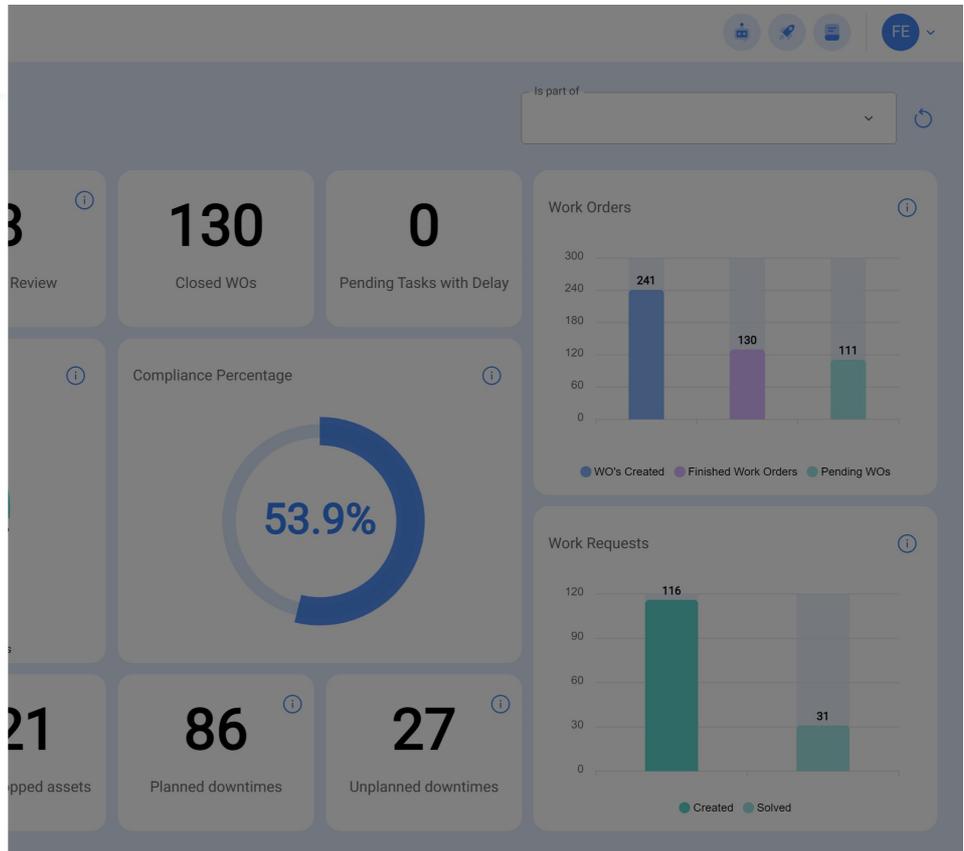


2. click on the business intelligence module

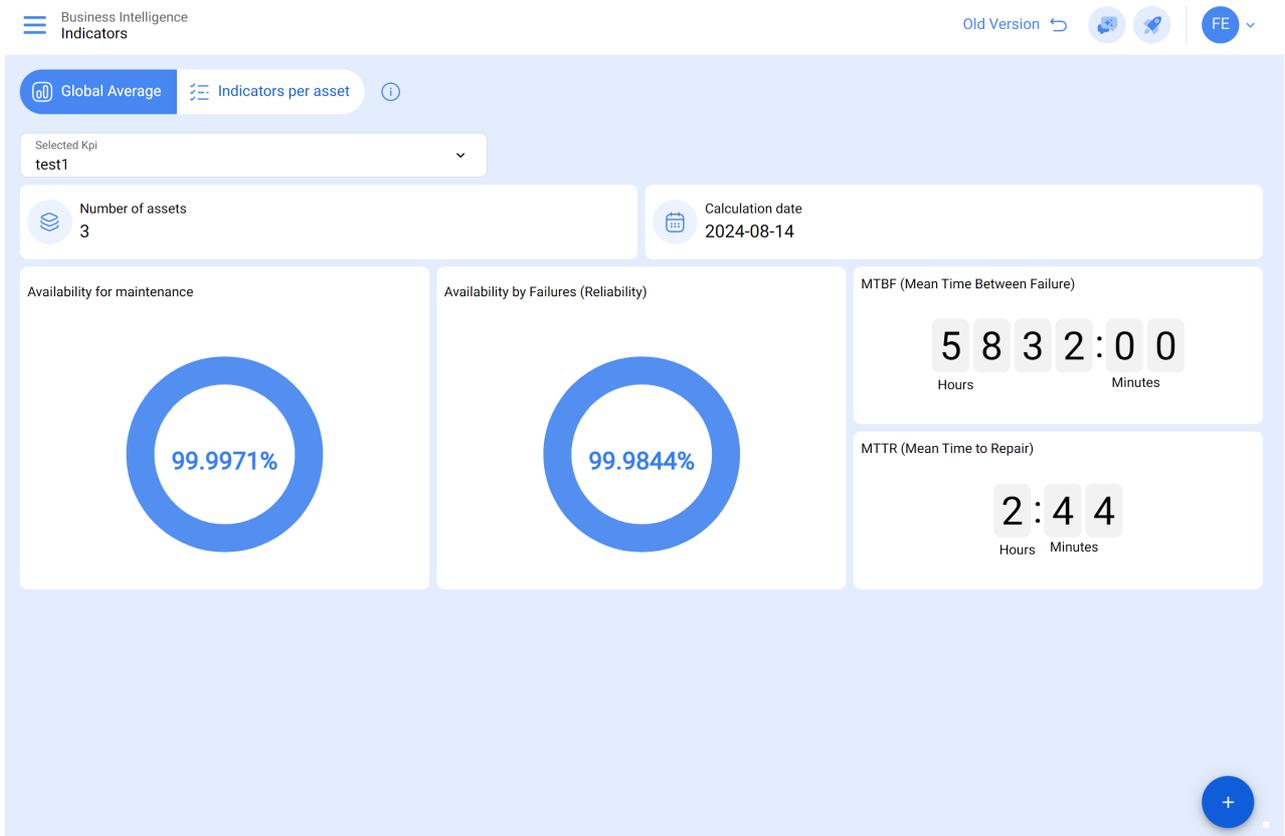


3. click on Indicators

- Catalogs
- Warehouses
- Work Management
- Monitoring
- Dispatcher
- Business Intelligence
 - Economical Analysis
 - Technical Analysis
 - Work request Analysis
 - Fractal BI
 - Indicators
 - Performance Analysis
 - Dashboard
- Cloud Disk
- Requests



Here you will see the KPI interface

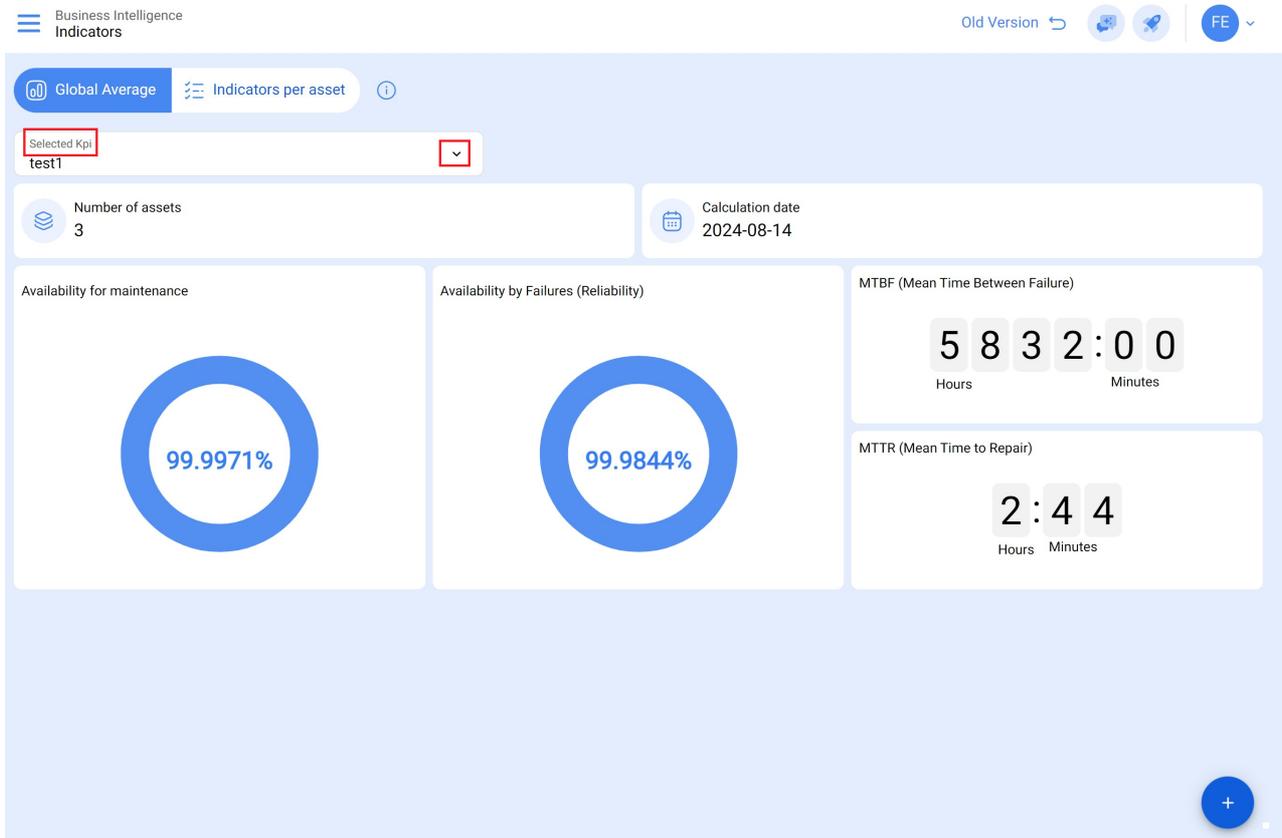


What can the user interact there?

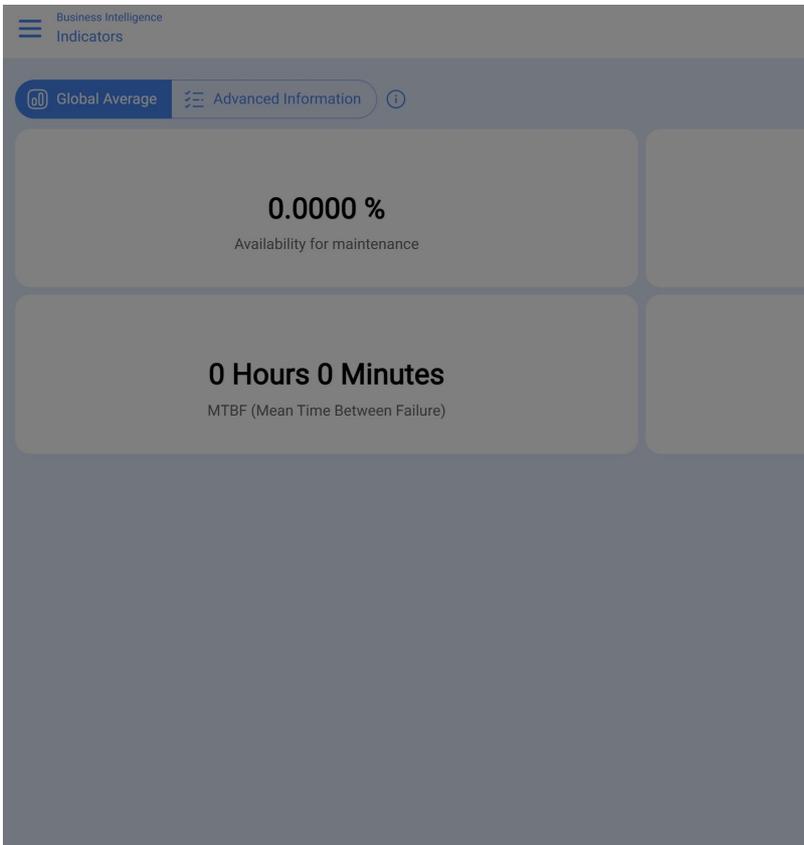
Calculated KPIs : In this space, users have the possibility to choose the date ranges to consult their KPIs. The highlight is the option to save these ranges for future queries, providing an even more efficient experience.

Step by Step: Configuring Calculated KPIs

1. Click on "Calculated KPIs".



2. Then click on the "+" button.



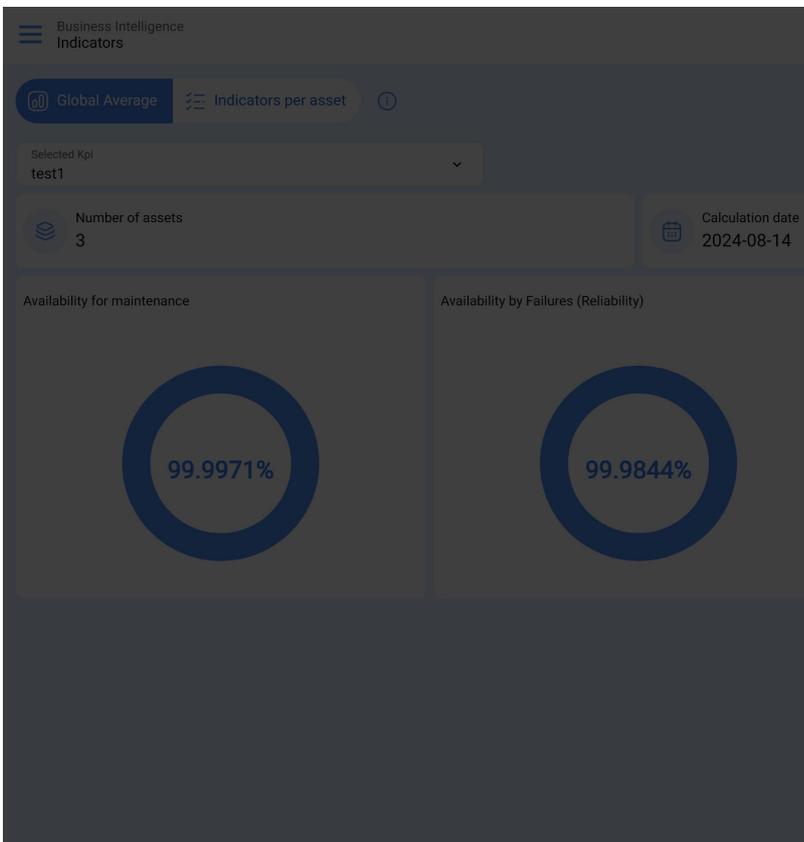
← CALCULATED KPIS

Showing 0 of 0

No data to show with these parameters

+

3. In the description, enter the name you want to use to identify your analysis. Then, select the date range you are interested in and complete the other fields to properly centralize your information, such as location, asset type, code, description, cost center, and forms.



← Add KPI

Description: RKP

Start date: 2024-08-14 13:15

End Date: 2024-08-14 13:15

Location: [Dropdown]

Asset Type: Equipment [Dropdown]

Code: [Text]

Description: [Text]

Priority: [Dropdown]

Type: [Dropdown]

Group 1: [Text]

Cancel | Calculate

4. Click on "Calculate".

Business Intelligence Indicators

Global Average Indicators per asset

Selected Kpi: test1

Number of assets: 3

Calculation date: 2024-08-14

Availability for maintenance: 99.9971%

Availability by Failures (Reliability): 99.9844%

Add KPI

Description: RKP

Start date: 2024-08-14 13:15

End Date: 2024-08-14 13:15

Location:

Asset Type: Equipment

Code:

Description:

Priority:

Type:

Group 1:

Cancel Calculate

5. To select the analysis based on the assigned dates and data, click on the star next to the name until it turns blue, as shown in the image.

Business Intelligence Indicators

Global Average Indicators per asset

Selected Kpi: INDICADORES FERMOS

Number of assets: 1114

Calculation date: 2024-08-06

Availability for maintenance: 99.9903%

Availability by Failures (Reliability): 99.8960%

Calculated KPIs

INDICADORES FERMOS

Status: Performed

Date range: 2024-07-01 07:00:00 - 2024-08-06 20:01:16

Number of Ass...: 1114

Filters: Yes

KPI JULIO

Status: Performed

Date range: 2024-06-30 23:00:00 - 2024-07-31 22:59:00

Number of Ass...: 4550

Filters: Yes

RFP

Status: Performed

Date range: 2024-08-13 15:24:59 - 2024-08-13 15:24:59

Number of Ass...: 49

Filters: Yes

test1

Status: Performed

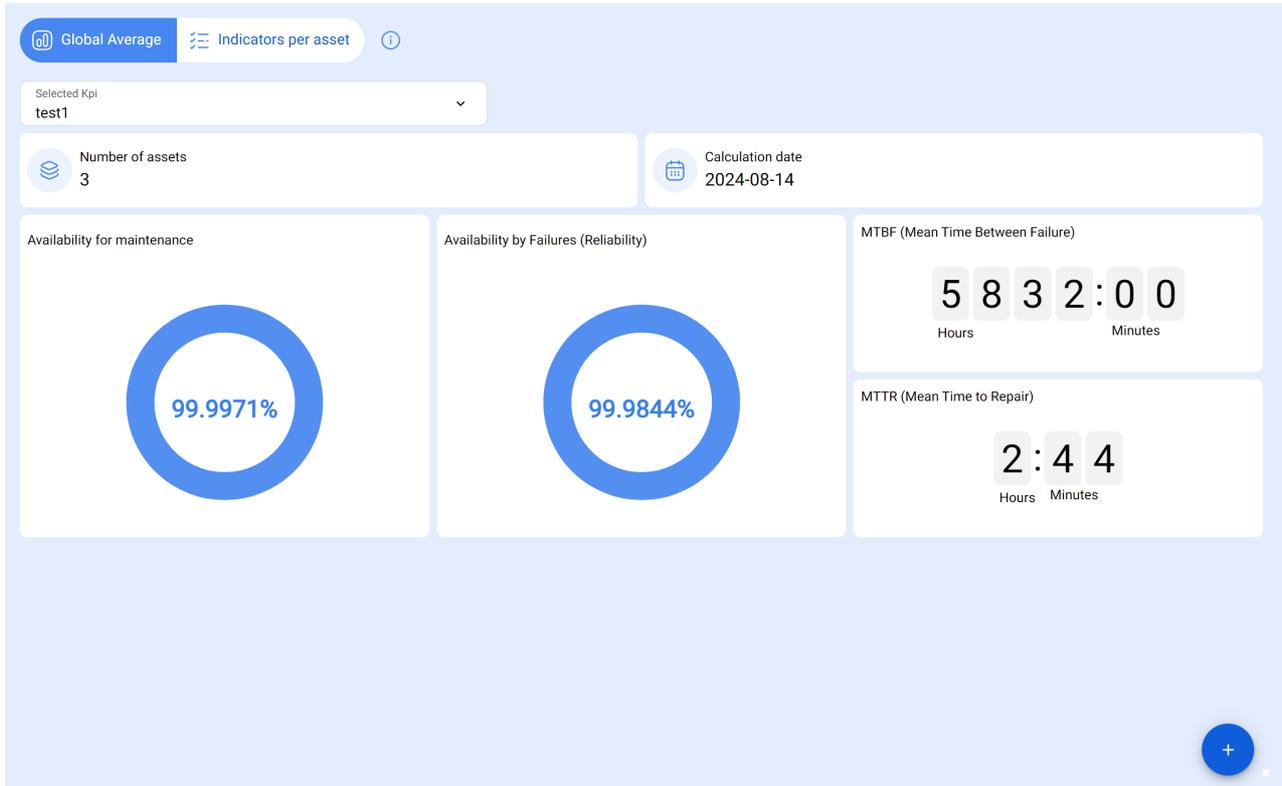
Date range: 2024-01-01 10:00:00 - 2024-08-31 11:00:00

Number of Ass...: 3

Filters: Yes

Showing 4 of 4

6. Once the information is loaded, you will be presented with the behavior of the indicators within the specified date range.



Global average: Commonly refers to the average calculation performed on the assets, taking into account that Fractal One 5.0 contemplates an average of a certain number of assets to extract the variables or data available.s.

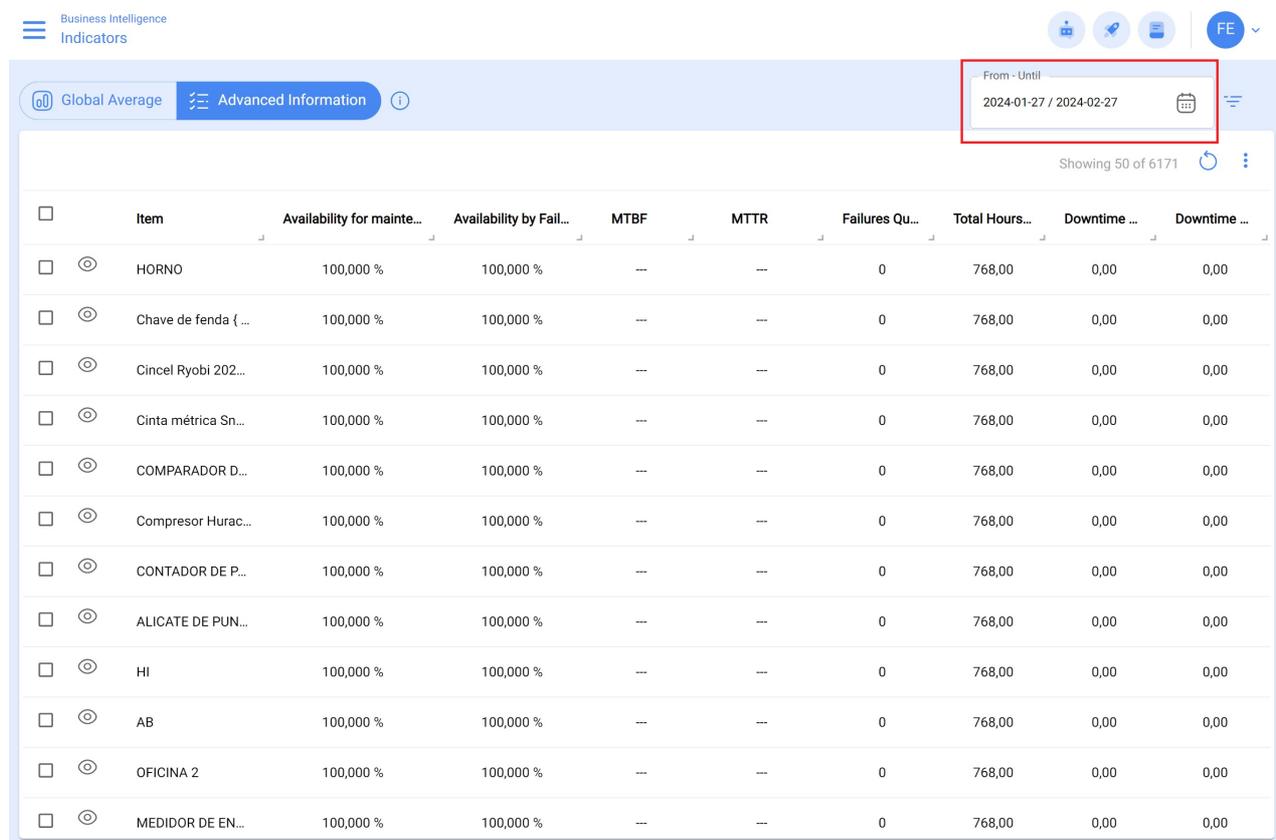
Advanced Information: In this section, we provide our users with a detailed explanation per asset, where the following aspects are evaluated

	1	2	3	4	5	6	7	8
Item	Availability for mainte...	Availability by Fail...	MTBF	MTTR	Failures Qu...	Total Hours...	Downtime ...	Downtime ...
HORNO	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Chave de fenda { ...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Cinzel Ryobi 202...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Cinta métrica Sn...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
COMPARADOR D...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Compresor Hurac...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
CONTADOR DE P...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
ALICATE DE PUN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
HI	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
AB	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
OFICINA 2	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
MEDIDOR DE EN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00

- 1. Maintenance availability:** Maintenance availability refers to the time during which an asset is operational and available for use, excluding time spent on planned maintenance activities. In other words, it represents the fraction of time during which the asset is operational and not scheduled for maintenance. la que el activo está en funcionamiento y no está programado para mantenimiento.
- 2. Availability due to failure (reliability):** Availability per failure, also known as reliability, indicates the ability of an asset to operate without interruption due to failures. It represents the percentage of time the asset is operational without experiencing problems or breakdowns.
- 3. MTBF (Mean Time Between Failures):** MTBF is the abbreviation of Mean Time Between Failures. It is a measure of reliability that represents the average time between failures of an asset, indicating the expected reliability.
- 4. MTTR (Mean Time To Repair):** MTTR is the abbreviation for Mean Time To Repair. It represents the average time required to repair an asset after it has experienced a failure.
- 5. Number of failures:** Refers to the total number of failures with downtime that an asset has experienced during a specific period.
- 6. Total hours:** This information serves as a basis for evaluating the performance of assets over a specific period.
- 7. Total hours due to breakdowns:** Indicates the total number of hours in which assets are out of service due to breakdowns and corrective interventions.

8. Maintenance downtime hours: Indicates the total number of hours in which assets are out of service due to planned maintenance activities.

Note: These indicators are evaluated under the date range selected at the top right of the interface.



The screenshot shows a dashboard with a table of asset performance metrics. At the top right, a date range filter is highlighted in red, showing 'From - Until' with the dates '2024-01-27 / 2024-02-27'. The table has columns for 'Item', 'Availability for maintenance', 'Availability by Failure', 'MTBF', 'MTTR', 'Failures Quantity', 'Total Hours', 'Downtime', and 'Downtime'. The table lists 12 assets, all with 100,000% availability and 0 failures.

<input type="checkbox"/>	Item	Availability for maintenance	Availability by Failure	MTBF	MTTR	Failures Qu...	Total Hours...	Downtime ...	Downtime ...
<input type="checkbox"/>	<input type="radio"/> HORNO	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> Chave de fenda { ...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> Cincel Ryobi 202...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> Cinta métrica Sn...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> COMPARADOR D...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> Compresor Hurac...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> CONTADOR DE P...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> ALICATE DE PUN...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> HI	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> AB	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> OFICINA 2	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00
<input type="checkbox"/>	<input type="radio"/> MEDIDOR DE EN...	100,000 %	100,000 %	---	--	0	768,00	0,00	0,00

By clicking on each asset, users can access the specific formulas we have implemented to calculate the final results. This ensures that each formula is adjusted and customized according to the selected asset.

Business Intelligence
Indicators per asset

Global Average Indicators per asset

Item	Availability for maintenance
{ GT2001 } LOCOMOTORA GT38	100,000 %

Showing 1 of 1

← Formula

Availability for maintenance

$$Availability = \frac{THP - \sum SHM}{THP} \times 100$$

Abbreviations

THP: Total hours in period

ΣSHM: Summation Downtime hours for maintenance

Availability For Breakdowns

$$Availability\ by\ Failures\ (Reliability) = \frac{THP - \sum SHB}{THP} \times 100$$

Abbreviations

THP: Total hours in period

ΣSHB: Summation Downtime hours by breakdowns

Meantime Between Failure

$$MTBF = \frac{(THP - SHB)}{FP}$$

Abbreviations

THP: Total hours in period

SHB: Downtime hours by breakdowns

FP: N° Faults in the Period

Meantime To Repair

$$MTTR = \frac{SHB}{FP}$$

We also provide an icon that redirects promptly to detailed information on each asset.

Business Intelligence
Indicators

Global Average Advanced Information

From - Until
2024-01-27 / 2024-02-27

Showing 50 of 6171

Item	Availability for mainte...	Availability by Fail...	MTBF	MTTR	Failures Qu...	Total Hours...	Downtime ...	Downtime ...
HORNO	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Chave de fenda { ...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Cinzel Ryobi 202...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Cinta métrica Sn...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
COMPARADOR D...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Compresor Hurac...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
CONTADOR DE P...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
ALICATE DE PUN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
HI	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
AB	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
OFICINA 2	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
MEDIDOR DE EN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00

You can specifically filter by location, location, asset type, code, cost center or custom form.

Business Intelligence Indicators

Global Average | Advanced Information ⓘ

Item	Availability for mainte...	Availability by Fail...	MTBF	MTTR
HORNO	100,000 %	100,000 %	---	---
Chave de fenda { ...	100,000 %	100,000 %	---	---
Cinzel Ryobi 202...	100,000 %	100,000 %	---	---
Cinta métrica Sn...	100,000 %	100,000 %	---	---
COMPARADOR D...	100,000 %	100,000 %	---	---
Compresor Hurac...	100,000 %	100,000 %	---	---
CONTADOR DE P...	100,000 %	100,000 %	---	---
ALICATE DE PUN...	100,000 %	100,000 %	---	---
HI	100,000 %	100,000 %	---	---
AB	100,000 %	100,000 %	---	---
OFICINA 2	100,000 %	100,000 %	---	---
MEDIDOR DE EN...	100,000 %	100,000 %	---	---

← FILTER

ASSET | WORK MANAGEMENT | WORK ORDERS

Location: [Dropdown]

Asset Type: [Dropdown]

Code: [Text]

Description: [Text]

Cost center: [Dropdown]

Custom Forms: [Dropdown]

Clear Filters | Apply Filters

General formula display icon: Here we provide our users with a detailed explanation of the various formulas we use to obtain the final results in a general way.

Business Intelligence Indicators

Global Average | Advanced Information ⓘ ⓘ

From - Until: 2024-01-27 / 2024-02-27

Showing 50 of 6171

Item	Availability for mainte...	Availability by Fail...	MTBF	MTTR	Failures Qu...	Total Hours...	Downtime ...	Downtime ...
HORNO	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Chave de fenda { ...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Cinzel Ryobi 202...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Cinta métrica Sn...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
COMPARADOR D...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
Compresor Hurac...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
CONTADOR DE P...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
ALICATE DE PUN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
HI	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
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OFICINA 2	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
MEDIDOR DE EN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00

Business Intelligence
Indicators per asset

Global Average Indicators per asset

Item	Availability for maintenance
{ GT2001 } LOCOMOTORA GT38	100,000 %

Showing 1 of 1

← Formula

Availability for maintenance

$$Availability = \frac{THP - \sum SHM}{THP} \times 100$$

Abbreviations

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Availability For Breakdowns

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Meantime Between Failure

$$MTBF = \frac{(THP - SHB)}{FP}$$

Abbreviations

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SHB: Downtime hours by breakdowns

FP: N° Faults in the Period

Meantime To Repair

$$MTTR = \frac{SHB}{FP}$$

Let us understand the formulas in detail:

1. What are the total hours in the period (HTP):

It corresponds to the total hours evaluated in the period of time (this data comes out of the filter by date range) in which the indicator is being evaluated (Image A) by the number of hours of average daily use of the assets evaluated (Image B).

Where do we find the above in Fractal One?

Time period evaluated (Image A)

Global Average **Advanced Information**

From - Until
2024-01-27 / 2024-02-27

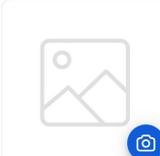
Showing 50 of 6171

<input type="checkbox"/>	Item	Availability for mainte...	Availability by Fail...	MTBF	MTRR	Failures Qu...	Total Hours...	Downtime ...	Downtime ...
<input type="checkbox"/>	HORNO	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	Chave de fenda { ...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	Cinzel Ryobi 202...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	Cinta métrica Sn...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	COMPARADOR D...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	Compresor Hurac...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	CONTADOR DE P...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	ALICATE DE PUN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	HI	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	AB	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	OFICINA 2	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00
<input type="checkbox"/>	MEDIDOR DE EN...	100,000 %	100,000 %	---	---	0	768,00	0,00	0,00

Number of hours of average daily use of the asset (Image B)

Aire 3

Save



Out of Service: No
Enabled

Information
You have pending changes to save!

Details

- General
- Custom Form
- Health Status Beta
- Financial
- Third Parties
- Spare Parts and Supplies



Is part of
// Curso presencial Colombia 2023/ Fractal/ Fractal Colombia/ Fractal Medellin/ Edfi 1/ Ofic

Nombre de equipo: Aire 3 Code: Aire-Ftt-Med-03

Fabricante: Fractal Especificación: Fractal 3

Número de serial: POTENCIA:

TIPO DE CONTRATO: Barcode: Priority: Very High

Type: AC Group 1: Chiller Group 2:

Supplier: Purchase date:

Hours of average daily use: 24:00 Visible to all

Planned Maintenance:

Recommendations:

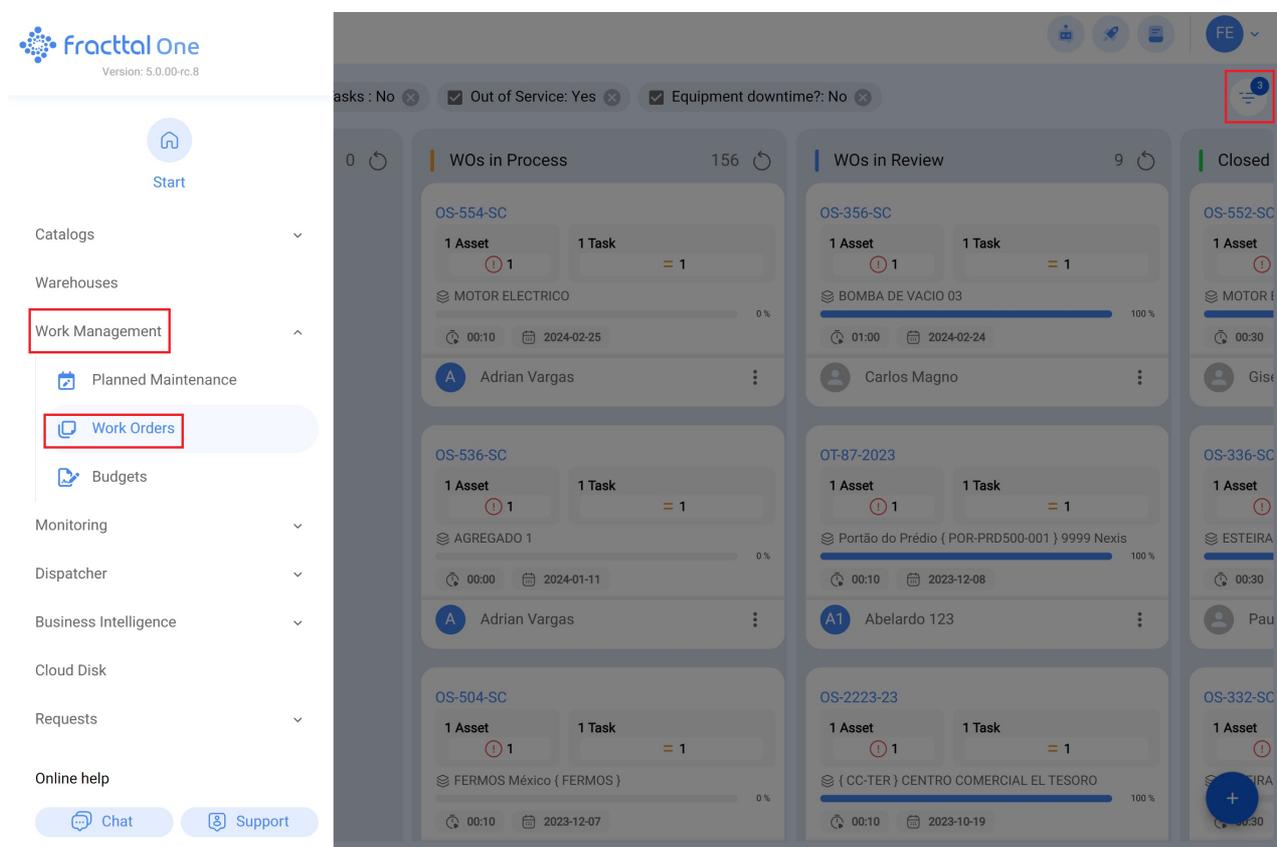
It is essential to avoid setting the "Average Daily Hours of Use" field to zero, as this setting could have a direct impact on the Total Hours in Period (TTH) and, consequently, on the KPIs. Maintaining a non-zero value in this field is essential to ensure the integrity of the calculations and the accuracy of the associated indicators.

2.What is the sum of maintenance downtime hours (HPM)?

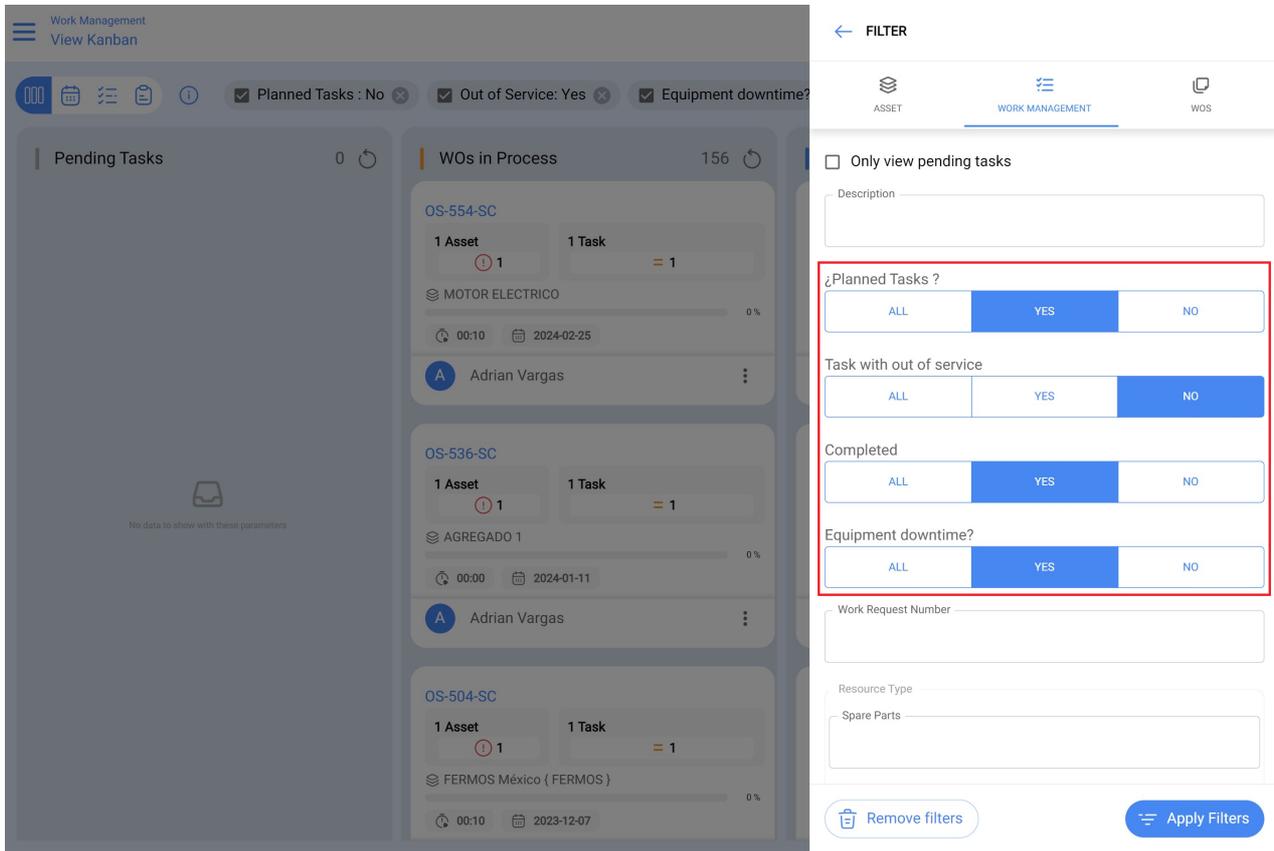
Corresponds to the actual downtime of the asset that is recorded in the Planned TOs.

Where do we find the above in Fractal One?

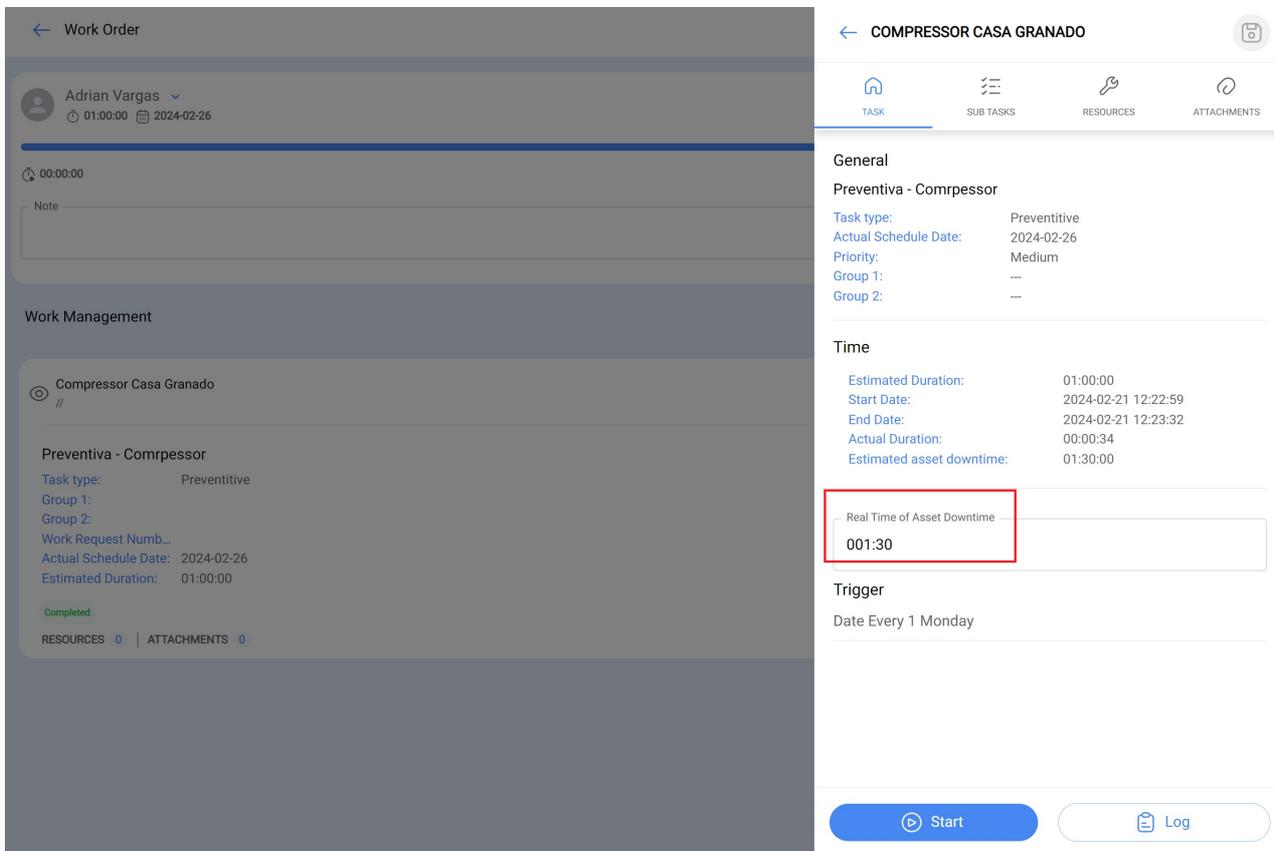
To find the above information in Fractal One, first go to the main menu and select the "Tasks" module and then "Work Orders" as shown below:



Then, filter by selecting the "Tasks" option and in the planning type box choose "Planned tasks", as shown in the following image:



Each task that we observe after applying the filter will contain a specific field, as shown in the image:



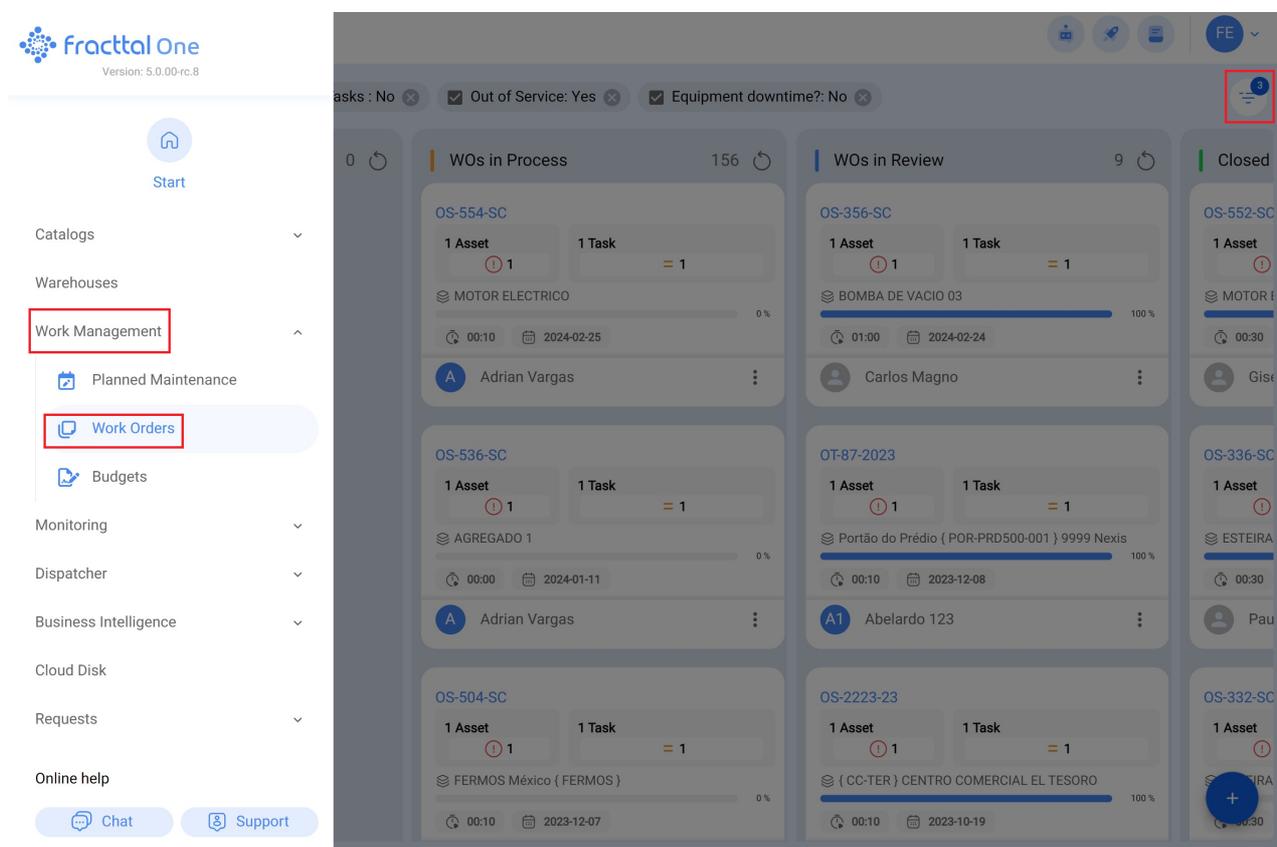
It is in this field where the downtime of the asset during each maintenance must be completed. This responsibility falls directly on the technician in charge of executing the planned task, and in turn, on the planner or supervisor, who must ensure that the information is properly recorded.

3.What is the Sum of downtime hours due to breakdown?

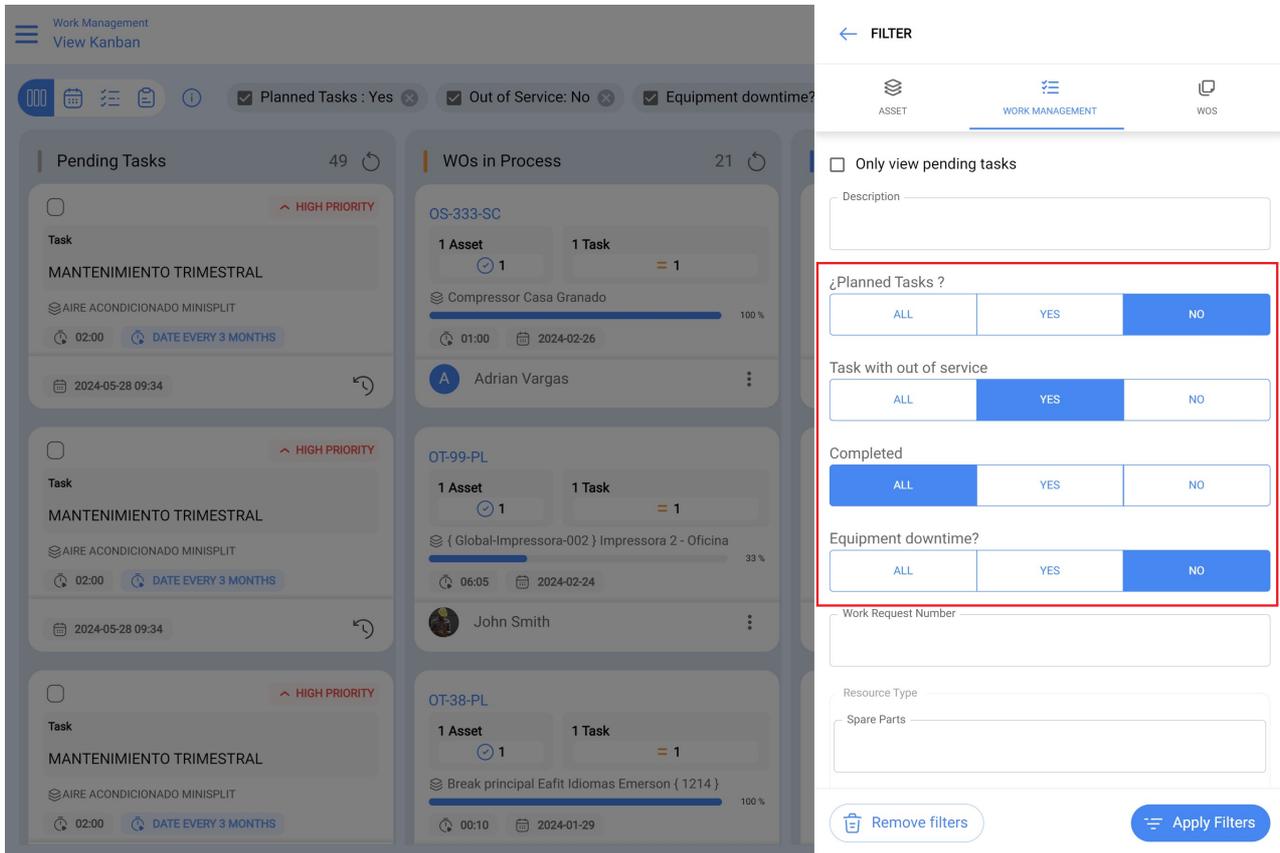
Corresponds to the out-of-service time recorded in the Unplanned tasks.

Where do we find the above in Fractal One?

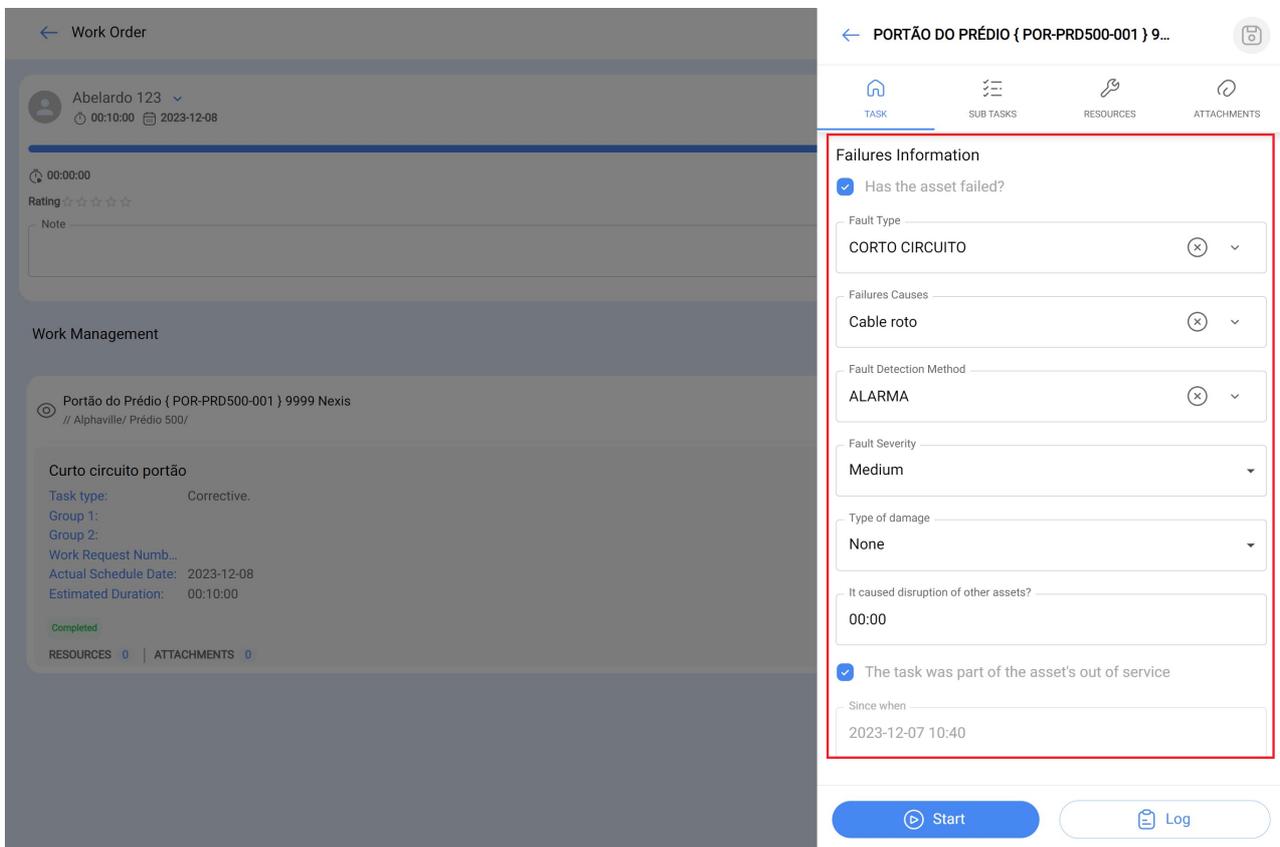
To find the above information in Fractal One, first go to the main menu and select the "Tasks" module and then "Work Orders" as shown below:



Then, make a filter by selecting the "Tasks" option and in the planning type box choose "NO" in "Planned tasks", and choose the "YES" option in ""Task with out of order" as shown in the following image:



Each task we identify after applying the filter will display specific fields, as shown in the image. It is essential to complete all these fields and, above all, to check the 'Failed active?' box.



If the equipment is out of service, it is necessary to check the box 'Active Out of Service' and then record the date and time when the equipment started to be out of service, as illustrated in the image.

The image shows a mobile application interface for a Work Order. The left panel displays the user 'Adrian Vargas' and task details for 'cambio de fusibles' (change of fuses) with a task type of 'CORRECTIVO'. The right panel shows the 'Failures Information' section with several dropdown menus: 'Fault Type' (CAVITATION), 'Failures Causes' (CABLE ROTO DE VENTILADOR), 'Fault Detection Method' (Analise Visual), 'Fault Severity' (Medium), and 'Type of damage' (None). Below these, there is a checkbox for 'Asset out of service' which is checked and highlighted with a red box, and a 'Since when' field containing '2023-12-07 14:53', also highlighted with a red box. At the bottom, there are 'Start' and 'Log' buttons.

These fields must be completed for each corrective maintenance. This responsibility falls directly on the technician in charge of executing the corrective task, and in turn, on the planner or supervisor, who must ensure that the information is properly recorded.

On the other hand, you should check in the configuration module, option Modules, specifically in the Work Orders section, that the option that indicates 'Set the out of service end date of the files with the task end date' is activated and appears in green, as shown in the image.

FRACTAL - Activación

Save

Type: Work Orders

OPTIONS AND PERMISSIONS	WORK ORDER ID	PRINTS
Description		
<input checked="" type="checkbox"/>		Allow adding attachments in finished WO's
<input type="checkbox"/>		Allow end / cancel WOs with pending material requisitions
<input checked="" type="checkbox"/>		Set the end date of out of service of the assets with the date of completion of the task (by default is the end date of the WO).
<input checked="" type="checkbox"/>		Allow assigned human resources to be responsible for the work order (Multi-responsible)
<input checked="" type="checkbox"/>		Allow editing of the real used qty with pending material requisitions
<input checked="" type="checkbox"/>		Allow technical profile users to visualize costs WO's
<input type="checkbox"/>		Allow to qualify the WO even though it is under review
<input type="checkbox"/>		Filter human resources according to the selected profile (Within a task)
<input checked="" type="checkbox"/>		Automatically generate link to share all WO

Note: For the MTBF and MTTR indicators, only failures with asset downtime are counted.